REMARKS

Claims 1-4 and 9-22 are all the claims pending in the application. Claims 10-18 have been amended. Support for amended claims 10, 11, 12, 16 and 17, can be found, for example, at page 2, lines 3-11, page 5, page 13, lines 6-23, page 16, lines 3-8 and the Examples of the present specification.

Entry of the above amendments is respectfully requested.

Initially, Applicants thank the Examiner for indicating that the claims are allowable over the art of record.

Claims 2-4 and 9-22 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. The Examiner asserts the following.

A. At least claims 10, 11, 12, 16 and 17 are confusing in the recitation "producing from an optical isomer of an amino acid represented..." According to the Examiner, neither the reactants nor the products produced are clearly identified.

The present invention is directed to an optical isomer II produced by reacting an optical isomer I and a biological material or a more pure optical isomer produced by reacting the optical isomer I and a biological material. *See* page 2, lines 3-11 and page 16, lines 3-8 of the present specification. In addition, the present invention is directed to an optical isomer II produced by reacting a mixture containing optical isomers and a biological material. *See* page 13, lines 6-23 of the present specification.

Accordingly, Applicants have amended claims 10, 11, 12, 16 and 17 for purposes of clarity, and respectfully request that the rejection be withdrawn.

B. Claims 2-4 and 9-22 are incomplete in the absence of a recovery step for the product produced. The Examiner asserts that there is no specific rule or statutory requirement which specifically addresses the need for a recovery step in a process of preparing a composition; however, it is clear from the record and would be expected from conventional preparation processes that the product must be isolated or recovered.

The Examiner will note that Applicants have amend the independent claims to recite an isolating step, as suggested by the Examiner, to more clearly define the present invention. Accordingly, Applicants respectfully submit that the rejection has been overcome and respectfully request that the rejection be withdrawn.

C. Claims 16-18 are vague indefinite and confusing in that it is unclear what is intended to be encompassed by "reacting a biological material which has an ability of converting". The nature of the "biological activity" is not identified and it is unclear what constitutes "an ability" in this context.

Applicants respectfully traverse for the following reasons.

In the present invention, the biological material possesses the ability to selectively produce an isomer based on the asymmetric carbon atom. That is, the biological material selects one of the isomers and converts it to the other isomer. *See* page 5, lines 8-16 of the present invention. Accordingly, various biological materials have differing selectivity, and may convert one isomer into the other (e.g., the L form into the D form) but not necessarily the reverse. This is explained, for example, in the specification at page 6, lines 3-6 and page 13, lines 6-18.

For example, in Example 1, the starting compound is D-p-chlorophenylalanine (optical isomer I), to which a cell suspension of containing cells of Nocardia diaphanozonaria strain JCM3208 was added, and L-p-chlorophenylalanine (optical isomer II) was obtained. Applicants submit that one of skill in the art would understand that a biological material converts one isomer into the other, and therefore would understand the meaning and scope of the phrase "ability of converting".

Accordingly, Applicants respectfully submit that one of skill in the art would understand the scope of the claims and that the claims comply with §112, second paragraph.

D. According to the Examiner, claims 16-18 are confusing and inconsistent in the recitation "(1)" when (I) appears to be intended at line 3. The Examiner inquires "in claim 18 is the compound (I) an optical isomer" and how is it altered?

With respect to the issue regarding (1) and (I), Applicants have amended the claims to correct the typographical error. Accordingly, Applicants submit that confusion and inconsistency have been overcome in view of the amendment.

With respect to claim 18, a biological material is reacted with a mixture of optical isomer I and optical isomer II where the optical isomer I is converted to optical isomer II. For example, at page 13, lines 12-18, the present specification discloses that an L-form of an amino acid (1) can be converted to the D-form thereof and the starting material may be a mixture of the D-form and the L-form.

Therefore, Applicants submit that the optical isomer I is converted to an optical isomer II of an amino acid compound having formula (1). Accordingly, Applicants

respectfully submit that one of ordinary skill in the art would understand the meaning and scope of claim 18, and respectfully request that the rejection be withdrawn.

E. Again, according to the Examiner, claim 18 is vague, indefinite and confusing in the recitation "with a racemic mixture..., wherein the mixture is not a racemic mixture". The Examiner asserts that this appears inconsistent and contradictory.

Applicants submit that claim 18 contains a typographical error. Therefore, Applicants have amended claim 18 by deleting the phrase "with a racemic mixture of said optical isomers I and II,". In view of the amendment, Applicants submit that one of skill in the art would understand the meaning and scope of claim 18.

Accordingly, withdrawal of the above rejection is respectfully requested.

F. According to the Examiner, claims 13-15 are vague, indefinite and confusing in that the nature of the "improved" optical purity cannot be determined. In addition, the Examiner asserts that the claims do not set forth with any particularity whether or not an enantiomer is produced.

Initially, Applicants note that the term "improved" is recited in the preamble of claims 13-15.

The present invention according to claims 13-15 are directed to a method for reacting a biological material with an amino acid (either an optical isomer I or optical isomer II). When more of one isomer is converted to the other, the optical purity of the resulting isomer is increased. In addition, the claims are directed to a method where not all of one isomer is converted completely to the other; however, more of one isomer is present compared to the other. As a result, the optical purity of one isomer

is improved (increased). *See* page 16, lines 3-8 of the present specification. Accordingly, one of ordinary skill in the art would understand the meaning and scope of the claims.

In addition, an optical isomer is obtained by the methods according to claims 13-15. Accordingly, Applicants have amended claims 13-15 to more clearly define that an optical isomer is obtained.

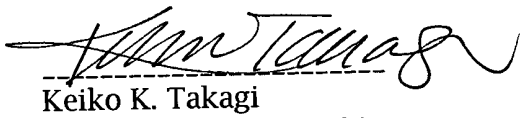
In view of the above, Applicants respectfully request that the rejection be withdrawn.

In summary, withdrawal of the foregoing rejections is respectfully requested in view of the amendments and remarks.

If any points remain in issue, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please claims have been changed as follows.

10. (new) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group, [an optical isomer II,]

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [which] has an ability of converting said optical isomer I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said optical isomer I]

wherein said biological material is one obtained from a microorganism belonging to the genus *Arthrobacter*, *Klebsiella*, *Nocardia*, *Rhizobium*, *Saccharopolyspora* or *Streptomyces*, and isolating an optical isomer II.

11. (new) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group, [an optical isomer II,]

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [which] has an ability of converting said optical isomer I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said optical isomer I]

wherein said biological material is one obtained from a microorganism classified to *Arthrobacter pascens*, *Flavimonas oryzihabitans*, *Klebsiella planticola*, *Nocardia diaphanozonaria*, *Pseudomonas chlororaphis*, *Pseudomonas oleovorans*, *Pseudomonas oxalaticus*, *Pseudomonas taetrolens*, *Rhizobium meliloti*, *Saccharopolyspora hirsuta* or *Streptomyces roseus*, and isolating said optical isomer II.

12. (new) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group, [an optical isomer II,]

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [which] has an ability of converting said optical isomer

I to said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said optical isomer I]

wherein said biological material is one obtained from *Arthrobacter pascens* strain IFO12139, *Flavimonas oryzihabitans* strain JCM2952, *Klebsiella planticola* strain JCM7251, *Nocardia diaphanozonaria* strain JCM3208, *Pseudomonas chlororaphis* strain IFO3521, *Pseudomonas oleovorans* strain IFO13583, *Pseudomonas oxalaticus* strain IFO13593, *Pseudomonas taetrolens* strain IFO3460, *Rhizobium meliloti* strain IFO14782, *Saccharopolyspora hirsuta subsp.kobensis* strain JCM9109 or *Streptomyces roseus* strain IFO12818, and isolating said optical isomer II.

13. (new) A method for improving the optical purity of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological activity [which] has an ability of converting an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with

said amino acid represented by Formula (I),]

wherein said biological material is one obtained from a microorganism belonging to the genus *Arthrobacter*, *Klebsiella*, *Nocardia*, *Rhizobium*, *Saccharopolyspora* or *Streptomyces*.

14. (new) A method for improving the optical purity of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological material [which] has an ability of converting an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said amino acid represented by Formula (I),]

wherein said biological material is one obtained from a microorganism classified to *Arthrobacter pascens*, *Flavimonas oryzihabitans*, *Klebsiella planticola*, *Nocardia diaphanozonaria*, *Pseudomonas chlororaphis*, *Pseudomonas oleovorans*, *Pseudomonas oxalaticus*, *Pseudomonas taetrolens*, *Rhizobium meliloti*, *Saccharopolyspora hirsuta* or *Streptomyces roseus*.

15. (new) A method for improving the optical purity of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said amino acid represented by Formula (1), wherein said biological material [which] has an ability of converting an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said amino acid represented by Formula (I),]

wherein said biological material is one obtained from *Arthrobacter pascens* strain IFO12139, *Flavimonas oryzihabitans* strain JCM2952, *Klebsiella planticola* strain JCM7251, *Nocardia diaphanozonaria* strain JCM3208, *Pseudomonas chlororaphis* strain IFO3521, *Pseudomonas oleovorans* strain IFO13583, *Pseudomonas oxalaticus* strain IFO13593, *Pseudomonas taetrolens* strain IFO3460, *Rhizobium meliloti* strain IFO14782, *Saccharopolyspora hirsuta subsp.kobensis* strain JCM9109 or *Streptomyces roseus* strain IFO12818.

16. (new) A method for producing an optical isomer II from an optical isomer I of an amino acid represented by Formula [(I)](1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with a racemic mixture of said optical isomers I and II, wherein said biological material [which] has an ability of converting an optical isomer I of said amino acid to an optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with a racemic mixture of said optical isomers I and II] and isolating said optical isomer II.

17. (new) A method for producing an optically active isomer II from an optical isomer I of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with said optical isomer I, wherein said biological material [which] has an ability of converting [an] said optical isomer I of said amino acid to [an optical] said optically active isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with said optical isomer I] and isolating said optically active isomer II.

18. (new) A method for producing an optically active amino acid having increased optical purity with respect to an optical isomer II of an amino acid represented by Formula [(I)] (1):

$$R\text{-}CH(NH_2)\text{-}COOH \qquad (1)$$

wherein R is an optionally substituted C1-C12 alkyl group, an optionally substituted C4-C8 cycloalkyl group or an optionally substituted C6-C14 aryl group,

said method comprising reacting a biological material with a mixture of an optical isomer I and said optical isomer II, wherein said biological material [which] has an ability of converting [an] said optical isomer I of said amino acid to [an] said optical isomer II, the isomerism being on the basis of an asymmetric carbon atom to which both of an amino group and a carboxyl group are bound and said ability being not inhibited seriously by an amino acid transferase inhibitor β-chloro-D-alanine, β-chloro-L-alanine or gabaculine, [with a racemic mixture of said optical isomers I and II,] wherein the mixture is not a racemic mixture.